5 things to consider for a more sustainable RAN

Communications service providers (CSPs) account for 2 to 3% of global energy demand[1]. And most of that demand comes from the radio access network (RAN) in 5G networks, accounting for about 70% of CSP energy use[2]. As energy prices continue to rise and CSPs work to meet their sustainability goals, solutions that optimize power utilization across their networks are critical. Together, Red Hat and our longtime partners, Intel and Ericsson, are collaborating to help CSPs improve energy efficiency. With intelligent hardware, software optimizations, and innovative operating environments, we achieved up to a 20% reduction in RAN power consumption[3] without sacrificing network performance.

Here are 5 ways CSPs can start building a more efficient RAN to advance their sustainability goals:

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1 Monitor power use effectively at scale

Monitoring and optimizing power consumption is crucial for more efficient resource management. The right tools will become vital in the pursuit of energy efficiency and environmental sustainability in physical and cloud-native network environments.

Cloud-native solutions such as Ericsson Cloud RAN can help CSPs collect and use information at large scale and across network domains, allowing them to:

‣ Limit power consumption and improve power-per-watt use.

‣ Make informed decisions, optimize resource allocation and ultimately improve the efficiency and sustainability of their infrastructure.

‣ Reduce overall energy consumption of future RAN deployments.

2 Enhance operational efficiency

Greater operational efficiency can result in dramatic reductions in wasted energy and carbon emissions without sacrificing quality of service. Even small gains in efficiency can translate into large sustainability improvements given the scale of most telecommunications networks.

Red Hat and our partners can help CSPs enhance their RAN efficiency by:

‣ Providing greater visibility and control over power consumption across the network.

‣ Helping to manage power consumption levels dynamically based on changing network conditions and workload requirements.

‣ Achieving more efficient power utilization without sacrificing service quality.

‣ Streamlining operations with powerful network automation provided by Red Hat® Ansible® Automation Platform.

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[1] "Energy efficiency: An overview." GSMA, 8 May 2019.

[2] Kolta, Emanuel, and Hatt, Tim."Going green: benchmarking the energy efficiency of mobile networks." GSMA, June 2021.

[3] "Building a sustainable cloud RAN solution with Ericsson, Intel, and Red Hat." YouTube video, August 2023.

3 Deploy more energy-efficient hardware

By upgrading to new-generation hardware designed for energy efficiency, CSPs can dramatically improve the energy profile of their RANs. Advanced central processing units (CPUs) and systems on a chip (SoCs) that optimize workload performance can provide substantial power savings.

Hardware provided by Red Hat partners such as Intel (4th Gen Intel® Xeon® Scalable Processors with Intel vRAN Boost) and Ericsson allows service providers to:

▸ Optimize workload performance and reduce system complexity

▸ Eliminate the need for external hardware acceleration

▸ Reduce virtualized radio access networks (vRAN) power consumption

4 Optimize operations with software controls

In addition to energy-efficient hardware, service providers can use advanced software solutions to further reduce power consumption.

CSPs can integrate software solutions designed to reduce energy consumption, such as Intel® Infrastructure Power Manager and Red Hat OpenShift®, into their network operations to:

▸ Recalibrate processor power states based on real-time workload needs.

▸ Enhance the level of control over power states (p-states) and idle states (c-states).

▸ Achieve an average power savings of 30% while maintaining key performance metrics.

▸ Automatically scale workloads based on their specific power consumption metrics.

5 Focus on collaboration with industry leaders

Working with technology leaders is key for CSPs looking for ways to develop and implement sustainability improvements and emissions reductions.

Together, Red Hat, Intel, and Ericsson are:

▸ Partnering to develop, integrate and deploy more sustainable open source solutions and cloud-native technologies.

▸ Bringing together original equipment manufacturers (OEMs), independent software vendors (ISVs), customers, and policymakers to promote industry-wide sustainability best practices.

▸ Aligning to provide more energy efficient networks to reduce energy costs and carbon emission.

Learn more

Watch this video to learn about how Red Hat, Intel, and Ericsson are helping CSPs build more sustainable cloud solutions.

About Red Hat

Red Hat helps customers standardize across environments, develop cloud-native applications, and integrate, automate, secure, and manage complex environments with award-winning support, training, and consulting services.

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